

## Warehousing Glossary

**AGVS** Automated guided vehicle system —describes systems of vehicles that can be programmed to automatically drive to designated points and perform preprogrammed functions. Guidance system may consist of a wire embedded in the floor, optical system or other types of guidance. Automated guided vehicle (AGV)

**2-way pallet** See Pallet

**3PL** Third party logistics (see separate listing)

**3PL** Third-Party Logistics - describes businesses that provide one or many of a variety of logistics-related services. Types of services would include public warehousing, contract warehousing, transportation management, distribution management, freight consolidation. A 3PL provider may take over all receiving, storage, value added, shipping, and transportation responsibilities for a client and conduct them in the 3PL's warehouse using the 3PL's equipment and employees, or may manage one or all of these functions in the client's facility using the client's equipment, or any combination of the above. Another term, 4PL is sometimes used to describe businesses that manage a variety of logistics related services for clients by using 3PLs. Also see Public Warehouse and Contract Warehouse or visit International Warehouse Logistics Association (IWLA) site.

**4-way pallet** See Pallet

**ABC stratification** method used to categorize inventory into groups based upon certain activity characteristics. Examples of ABC stratifications would include ABC by velocity (times sold), ABC by sales dollars, ABC by quantity sold / consumed, ABC by average inventory investment, ABC by margin. ABC stratifications are used to develop inventory planning policies, set count frequencies for cycle counting, slot inventory for optimized order picking, and other inventory management activities.

**Activity based costing** usually refers to costing method that breaks down overhead costs into specific activities (cost drivers) in order to more accurately distribute the costs in product costing. Has also been applied to customer and vendor management.

**Actual cost** inventory costing method used in manufacturing environments that uses the actual materials costs, machine costs, and labor costs reported against a specific work order to calculate the cost of the finished item.

**ADC** Automated data collection. See Automated Data Collection

**Advanced planning and scheduling** software system designed to integrate with ERP and MRP systems to enhance the short term production planning and scheduling systems that are notoriously inadequate in MRP systems. APS systems have extensive programming logic that allows them to be more effective in dealing with rapidly changing customer demands.

**Advanced shipment notification** advanced shipment notifications (ASNs) are used to notify a customer of a shipment. ASNs will often include PO numbers, SKU numbers, lot numbers, quantity, pallet or container number, carton number. ASNs may be paper-based, however, electronic notification is preferred. Advanced shipment notification systems are usually combined with bar-coded compliance labeling which allows the customer to receive the shipment into inventory through the use of bar-code scanners and automated data collection systems.

**AIDC** Automatic identification & data collection. See Automated Data Collection

**Allocations** allocations in inventory management refer to actual demand created by sales orders or work orders against a specific item. The terminology and the actual processing that controls allocations will vary from one software system to another. A standard allocation is an aggregate quantity of demand against a specific item in a specific facility, I have heard standard allocations referred to as normal allocations, soft allocations, soft commitments, regular allocations. Standard allocations do not specify that specific units will go to specific orders. A firm allocation is an allocation against specific units within a facility, such as an allocation against a specific location, lot, or serial number. Firm allocations are also referred to as specific allocations, frozen allocations, hard allocations, hard commitments, holds, reserved inventory. Standard allocations simply show that there is demand while firm allocations reserve or hold the inventory for the specific order designated.

**APS** see Advanced Planning and Scheduling

**ASN** see Advanced Shipment Notifications

**ASP** Application service provider—a twist in software marketing in which the software licenses are owned by the ASP and reside on their system while the client rents the rights to use the software. The ASP may be the software manufacturer or a third party business. The benefits to an using an ASP are lower upfront costs, quicker implementations, and the reduction of the need for internal IS personnel and mainframe/server hardware. It is hoped that ASPs will allow small to midsize businesses greater access to technology than was previously available. More recently the terms SaaS (Software as a Service) and On-demand Software have emerged to describe this same scenario.

**ASRS** see Automated Storage and Retrieval Systems

**Autodiscrimination** the functionality of a bar-code reader to recognize the bar-code symbology being scanned, thus allowing a reader to read several different symbologies consecutively.

**Automated data collection** systems of hardware and software used to process transactions in warehouses and manufacturing operations. Data collection systems may consist of fixed terminals, portable terminals and computers, Radio frequency (RF) terminals, and various types of bar code scanners. a.k.a. Automated data capture, AIDC, Automatic identification & data collection.

**Automated storage and retrieval systems** a system of rows of rack, each row having a dedicated retrieval unit that moves vertically and horizontally along the rack picking and putting away loads. a.k.a. ASRS, AS/RS, Unit-load ASRS and Mini-load ASRS.

**Available** refers to the status of inventory as it relates to its ability to be sold or consumed. Availability calculations are used to determine this status. Availability calculations vary from system to system but basically subtract any current allocations of holds on inventory from the current on-hand balance. An example of an availability calculation would be: [Quantity Available] = [Quantity On Hand] - [Quantity On Hold] - [Quantity Allocated To Sales Orders] - [Quantity Allocated to Production Orders].

**Available to promise** available to promise takes the simple availability calculation, adds time phasing and takes into account future scheduled receipts. Available to promise may be calculated for each day or broken down into larger time buckets. The first time period will take on-hand inventory and add any scheduled receipts for that period. It will then deduct any allocations scheduled prior to the next scheduled receipt (which may be several periods in the future). Subsequent periods without any scheduled receipts will have the same available to promise as the previous period. Subsequent periods with scheduled receipts will generally start with a fresh calculation, ignoring any remaining available to promise from previous periods. There are many variations on exactly how available to promise is calculated and it is also important to note that available to promise often works independently of allocation systems. This can sometimes create conflicts.

**Average cost** inventory costing method that recalculates an item's cost at each receipt by averaging the actual cost of the receipt with the cost of the current inventory.

**Backflush** method for issuing (reducing on-hand quantities) materials to a manufacturing order. With backflushing, the material is issued automatically when production is posted against an operation. The backflushing program will use the quantity completed to calculate through the bill of material the quantities of the components used, and reduce on-hand balances by this amount. There are usually options during the backflush process to report scrap. In operations using backflushing it is advisable to set up specific machine locations and have materials transferred from storage locations to machine locations when they are physically

picked for production. The backflush operation will then issue the material from the machine locations.

**Backhaul** transportation term that describes the activity of picking up, transporting, and delivering a new load on a return trip from delivering another load (known as the fronthaul, though the term fronthaul is not used very frequently).

**Backorder** a specific quantity of a specific item that could not be filled on the requested date.

**Batch picking** order picking method where orders are grouped into small batches, an order picker will pick all orders within the batch in one pass. Batch picking is usually associated with pickers with multi-tiered picking carts moving up and down aisles picking batches of usually 4 to 12 orders, however, batch picking is also very common when working with automated material handling equipment such as carousels. See also Zone picking, Wave picking. Article Order Picking

**Bill of material** lists materials (components or ingredients) required to produce an item. Multilevel BOMs also show subassemblies and their components. Other information such as scrap factors may also be included in the BOM for use in materials planning and costing.

**Blanket order** a type of purchase order that commits to purchase a specific quantity over a specific period of time, but does not necessarily provide specific dates for shipments. Blanket orders are placed for the quantity of an item (or group of items) that you expect to purchase over extended period of time (3 months, 6 months, a year, etc). A blanket purchase order may provide estimated required dates for specific quantities, but actual releases to ship against the blanked order are triggered by separate requests from the customer to the supplier; the specific quantities and dates of these separate requests (releases) may or may not be similar to the estimated dates and quantities. Providing a blanket order to a supplier may reduce lead times and increase on-time shipments from the supplier and may provide a greater discount on purchases.

**Blanks** generally describes discrete units (usually uniform sized units) that are usually produced through a cutting process but are not yet finished items. For example, if a die cutting machine cuts sheets of steel into small rectangular pieces that will later be machined and painted, the unfinished rectangular pieces may be referred to as blanks. Stampings are sometimes referred to as blanks, however, all blanks are not necessarily stampings. See also Stamping

**Blind counts** describes method used in cycle counting and physical inventories where you provide your counters with item number and location but no quantity information.

**BOM** see Bill of material

**Bonded Warehouse** a facility or a dedicated portion of a facility where imported goods are stored prior to customs duties and taxes being paid. These facilities are often used to delay the payment of import fees until the products are actually sold/shipped (when they physically leave

the bonded facility). This can be particularly useful when products are received well in advance of sale or when a portion of the product received may eventually be returned or scrapped (thus preventing paying import fees on items not sold). Bonded warehouses are licensed by the government. I believe the same concept can also be applied to specially taxed domestic products such as alcohol and tobacco products. See also FTZ (Foreign Trade Zone)

**Browser-based applications** software designed to run within a web browser (i.e. Internet Explorer). This allows a user to access the application from any location that has internet access and a web browser (no additional software is needed on the computer accessing the application).

**Bulk** the classic use of the term bulk (bulk materials, bulk inventory, bulk storage) in inventory management and distribution refers to raw materials such as coal, iron ore, grains, etc. that are stored or transported in large quantities. This would include rail cars, tanker trucks, or silos full of a single material. However, this term can also have a variety of other definitions based upon the specific industry or facility. For example, a small-parts picking operation may refer to a case storage area as "bulk", while a case-picking operation may refer to the full-pallet area as the "bulk area".

**Cantilever Rack** racking system in which the shelving supports are connected to vertical supports at the rear of the rack. There are no vertical supports on the face of the rack allowing for storage of very long pieces of material such as piping and lumber.

**Capacity** requirements planning process for determining amount of machine and labor resources required to meet production.

**Carousel** type of automated material handling equipment generally used for high-volume small-parts order-picking operations. Horizontal carousels are a version of the same equipment used by dry cleaners to store and retrieve clothing. They have racks hanging from them that can be configured to accommodate various size storage bins. Vertical carousels consist of a series of horizontal trays on a vertical carousel. Vertical carousels are frequently used in laboratories and specialty manufacturing operations. More info on carousels on Automated Equipment Pics Page.

**Carrying cost** also called holding cost, carrying cost is the cost associated with having inventory on hand. It is primarily made up of the costs associated with the inventory investment and storage cost. For the purpose of EOQ calculations, if the cost does not change based upon the quantity of inventory on hand it should not be included in carrying cost. Carrying cost is represented as the annual cost per average on-hand inventory unit.

**Carton clamp** lift truck attachment that operates like a paper roll clamp except the clamping surface is flat rather than circular.

**Casting** generally describes an unfinished item made of metal that is produced through pouring molten metal into a mold. A casting is later machined into a finished or semi-finished item. Also describes the process used to produce castings.

**Catch weight** used primarily in the food industry for products such as seafood, meats, and cheeses; catch weights refer to the actual weight of variable-weight items that use weight as the sales unit of measure. Catch weights are generally recorded during the order picking or shipping process. Systems using catch weights must be able to correctly process sales order line items based on the catch weights being within specific tolerances of the "order quantity".

**CCD** see Charged Coupled Device

**Chargeback** chargebacks are becoming more common these days as customers become more specific with their agreements with suppliers. A chargeback is basically a financial penalty placed against a supplier by a customer when a shipment to the customer does not meet the agreed upon terms and conditions. Examples of where suppliers may be charged back would include late shipments, lack of proper packaging and labeling (compliance labels), incorrect shipping terms (shipping collect instead of prepaid or not using the correct carrier or account).

**Charged coupled device** used to describe a type of barcode scanner that acts like a small digital camera taking a digital image of the barcode as opposed to the standard barcode scanner that uses a laser. CCD scanners are a low cost option for scanning barcodes at a short distance (usually within a few inches).

**Clear height** distance measured from the floor to the bottom of the lowest hanging overhead obstruction. Sometimes realtors will use the distance to the bottom of the roof trusses to calculate clear height even though portions of the building may have lower clear heights due to HVAC units or other equipment suspended from the roof.

**COGS** Cost of Goods Sold (see separate listing)

**Commodity** in inventory management, the term Commodity has a couple of definitions. Standard products commonly available from various sources are often called "commodity items". Specialized or custom products not widely available or proprietary products only available from a small number of sources would not be considered commodity items. The term Commodity is also used to describe classifications of inventory. In this case, "commodity codes" are used to distinguish groups of inventory items to be used for reporting and analysis. Note that commodity classifications can be used to describe any inventory item and are not limited to items that fall under the previous definition of commodity items.

**Compliance labels** standardized label formats used by trading partners. Compliance labels are used as shipping labels, container/pallet labels, carton labels, or piece labels, and usually contain bar codes. Many bar-code labeling software products now have the more common compliance label standards set up as templates.

**Configuration processing** software functionality that allows a product to be defined by a selecting various pre-defined options, rather than having every possible combination of options pre-defined as specific SKUs. Placing an order for a computer and specifying hard drive, processor, memory, graphics card, sound card, etc. would be an example of configuration processing.

**Consignment inventory** inventory that is in the possession of the customer, but is still owned by the supplier. Consignment inventory is used as a marketing tool to make it easier for a customer to stock a specific supplier's inventory.

**Consumer goods** products sold to non-business end users. Clothing, food, Music CDs, are examples of consumer goods.

**Consumer Packaged Goods** describes inventory that is in such a form that is ready for sale to consumers (end-users).

**Container** although a container can be anything designed to hold (contain) materials for storage or transport, the most common definition for Container in logistics refers to the specific types of containers used for intermodal transportation, often referred to as "Ocean Containers". Standard external dimensions for containers are width of 8', height of 8' 6" or 9' 6" (High Cube), and lengths of 20', 40', 45' (deduct 4" from width, 9" from height and 7" to 9" from length to determine inside dimensions). More specs and info on containers at Seaboard Marine, Maersk Sealand, and The Intermodal Container FAQ put out by a commercial photographer.

**Containerization** from the JIT movement in manufacturing, containerization refers to using standardized containers for the storage and transport of materials within a manufacturing facility as well as between vendors and manufacturers. Materials are ordered in multiples of the container quantity often using Kanban. The benefits of containerization include reduced product damage, reduced waste (by using reusable containers), less handling, and greater levels of inventory accuracy by simplifying counting processes.

**Contract warehouse** a contract warehouse is a business that handles shipping, receiving, and storage of products on a contract basis. Contract warehouses will generally require a client to commit to a specific period of time (generally in years) for the services. Contracts may or may not require clients to purchase or subsidize storage and material-handling equipment. Fees for contract warehouses may be transaction and storage based, fixed, cost plus, or any combination. Also see Public Warehouse and 3PL.

**Coproduct** the term coproduct is used to describe multiple items that are produced simultaneously during a production run. Coproducts are often used to increase yields in cutting operations, such as die cutting or sawing, when it is found that scrap can be reduced by combining multiple sized products in a single production run. Coproducts are also used to reduce the frequency of machine setups required in these same types of operations. Coproducts, also known as byproducts, are also common in process manufacturing such as in

chemical plants. Although the concept of coproducts is fairly simple, the programming logic required to provide for planning and processing of coproducts is very complicated and most off-the-shelf manufacturing software will have problems with coproduct processing.

**Cost of goods sold** accounting term used to describe the total value (cost) of products sold during a specific time period. Since inventory is an asset, it is not expensed when it is purchased or produced. It instead goes into an asset account (usually called Inventory). When product is sold, the value of the product (the cost, not the sell price) is moved from the asset account to an expense account called cost of goods sold or COGS. COGS appears on the profit-and-loss statement and is also used for calculating inventory turns.

Costing method refers to the calculations used to determine inventory cost. See also Average Cost, Current Cost, Standard Cost, Actual Cost, Landed Cost, First-in-first-out, Last-in-last-out.

**CPG** Consumer Packaged Goods (see separate listing)

**Cross-belt sorter** conveyor sorting system that uses a series of devices (carriers) mounted on a conveyor to sort materials. Each device has a small belt conveyor mounted on top of it that runs perpendicular to the direction of the main conveyor. When it arrives at a sort point, the conveyor on the carrier will spin, moving the materials to the side of the main conveyor (usually onto another conveyor, dropping down a chute, or into a container).

**Cross-docking** in its purest form cross-docking is the action of unloading materials from an incoming trailer or rail car and immediately loading these materials in outbound trailers or rail cars, thus eliminating the need for warehousing (storage). In reality, pure cross-docking is rare outside of transportation hubs and hub-and-spoke type distribution networks. Many "cross-docking" operations require large staging areas where inbound materials are sorted, consolidated, and stored until the outbound shipment is complete and ready to ship. This staging may take hours, days, or even weeks in which case the "staging area" is essentially a "warehouse".

**CRP** Capacity requirements planning (see separate listing)

**Cube** a measure of the volume of rectangular shaped three-dimensional objects or spaces. Cube is calculated by multiplying the length times the width times the height of the object or space.

**Cube logic** term used in Warehouse Management Systems. Cube logic is often incorporated but seldom used in WMS systems because of its tendency to treat your product as liquid (fitting a round peg in a square hole). See article on Warehouse Management Systems.

**Cube utilization** in warehousing and logistics, cube utilization refers to the use of space within storage area, trailer, or container. Cube utilization is generally calculated as a percentage of total space or of total "usable" space.

**Cubed out** describes a condition where all space in a trailer or container has been completely filled. The term "cubed out" is often used when you have completely filled the trailer or container but are still below the weight capacity. Also see Weighted out.

**Current cost** inventory costing method that applies the cost of the most recent receipt to all inventory of a specific item.

**Cycle count** refers to process of regularly scheduled inventory counts (usually daily) that "cycles" through your inventory. User determines how often certain items/locations are counted.

**Data collection** See Automated Data Collection (ADC)

**DC** Distribution Center

**Demand** the need for a specific item in a specific quantity. See Dependent Demand and Independent Demand.

**Dependent demand** demand generated from scheduled production of other items.

**Dim weight** see Dimensional weight

**Dimensional weight** formula used to determine freight charges when the minimum weight to volume ratio has not been met. Actual weight and dim weight are compared, and the larger weight is used for the freight calculation. Dim weight is calculated by:  $\text{Dim weight} = (\text{Length} \times \text{Width} \times \text{Height}) / 194$ . All dimensional measurements are in inches. a.k.a. Dim weight

**Direct ship** direct shipping and drop shipping are two terms generally used interchangeably. They describe a process whereby three parties interact with the sales transaction (the buyer, the seller, and the supplier). The buyer initiates a purchase from the seller, who then arranges with the supplier to ship the product directly to the buyer. The seller does not carry inventory of the product and the supplier does not have any direct communication with the buyer. The buyer pays the seller and the seller pays the supplier. Though both terms (direct ship and drop ship) are generally used to describe the same process, I've always considered a small distinction between the two that relates to where you are in the supply chain. To the seller, direct shipping describes both the process and an inventory/sales strategy, however, the supplier will frequently just use the term "drop ship" to describe the process whereby he is shipping the product to an address other than that of his customer (the business that is paying him for the product). Sometimes the term drop ship also describes the process of shipping to any location that is different from the customer's normal shipping location. This subtle distinction is sometimes evident in the terminology used in software documentation. Direct shipment, Drop shipment.

**Discrete manufacturing** describes manufacturing of distinct items (items you can easily count, touch, see) such as a pencil, a light bulb, a telephone, a bicycle, a fuel pump, etc. Discrete as opposed to Process manufacturing. Also see Process Manufacturing.

**Distribution** describes the process of storing, shipping, and transporting goods. Also describes the facilities (distribution operations, distribution centers) that conduct these activities. In statistical analysis, describes the measurement of a group of events or occurrences (see Normal distribution).

**Distribution requirements planning** process for determining inventory requirements in a multiple plant/warehouse environment. DRP may be used for both distribution and manufacturing. In manufacturing, DRP will work directly with MRP. DRP may also be defined as Distribution Resource Planning which also includes determining labor, equipment, and warehouse space requirements.

**Dock leveler** device that provides a bridge to the trailer as well as a ramp to facilitate the transition in height from dock to trailer. Dock levelers are rated by weight capacity and by the service range. The service range, also known as the height differential, rates the safe range above and below dock level you can use the leveler to transition to the trailer height.

**Double-deep rack** a type of pallet rack designed to be used with double-deep reach trucks that allow storage of palletized loads 2-deep in rack. Double-deep rack may be a unique design (designed specifically for double-deep storage) or may just be a double-deep configuration of standard selective pallet rack. Also see Reach truck and check out article on Aisle Widths.

**Drive-in rack** racking system designed to allow a lift truck to drive into the bay creating very high density storage for non-stackable loads. Useful for operations with limited SKUs and high quantities of pallets per SKU. FIFO is difficult to maintain in drive-in racking systems. a.k.a. Drive-thru Rack. Also see Racking Pics Page.

**Drop ship** see Direct ship.

**DRP** Distribution requirements planning (see separate listing)

**Drum-handling attachments** describes the various designs of lift-truck attachment used to handle 55 gallon drums. Some are smaller versions of a paper roll clamp while others may engage the upper rim of the drum, or the lower rings. Some drum attachments are capable of picking up multiple drums at the same time.

**Dunnage** fill material. Types of dunnage include loose fill (packing peanuts), paper, bubble wrap, foam, and air pillows.

**Dynamic slotting** this is a term sometimes used by WMS providers to describe a higher level of slotting functionality. Unfortunately, there is not a standard definition for this, but it

usually refers to the ability to change slotting recommendations as item profiles, order profiles, or other operational characteristics change.

**Economic order quantity** result of a calculation that determines the most cost effective quantity to order (purchased items) or produce (manufactured items). The formula basically finds the point at which the combination of order cost and carrying cost is the least. The standard formula is  $EOQ = \text{Square Root} [2 * (\text{Annual Usage}) * (\text{Order Cost}) / (\text{Annual Carrying Cost/unit})]$ . The difficult part of implementing the formula is getting accurate values for order cost and carrying cost. For more info on EOQ see my article [Optimizing EOQ](#) or check out my book on inventory management. .

**Effective lead time** effective lead time represents a period of time that includes the lead time (see [Lead time](#)), plus additional time factors that may occur between the time the need for an order is known, and the inventory is in stock and available. For example, a fixed ordering schedule (orders are only placed on specific days for specific vendors) may add some time to the lead time, as may some internal processing.

**Electronic product code** EPC is the RFID version of the UPC barcode. EPC is intended to be used for specific product identification. However, EPC goes beyond UPC by not only identifying the product as an SKU, but also providing access to additional data about the origin and history of the specific units. The EPC tag itself identifies the manufacturer, product, version, and serial number. It's the serial number that takes EPC to the next level. This is the key to data related to specific lots/batches as well as potentially tracking the specific unit's history as it moves through the supply chain. This data is stored somewhere else (the internet or other network) but a standardized architecture allows you to access the data much like you would access a web page (though this would be happening automatically behind the scenes). See my article on [RFID](#) for more info.

**Enterprise resource planning** describes software systems designed to manage most or all aspects of a manufacturing or distribution enterprise (an expanded version of MRP systems). ERP systems are usually broken down into modules such as Financials, Sales, Purchasing, Inventory Management, Manufacturing, MRP, DRP. The modules are designed to work seamlessly with the rest of the system and should provide a consistent user interface between them. These systems usually have extensive set-up options that allow you to customize their functionality to your specific business needs. Unfortunately, in the real world, ERP systems rarely are sufficient to meet all business needs and a myriad of other software packages such as Customer Relationship Management (CRM), Manufacturing Execution Systems (MES), Advanced Planning and Scheduling (APS), Warehouse Management Systems (WMS) and Transportation Management Systems (TMS) are being sold to make up for these deficiencies.

**EOQ** Economic order quantity (see separate listing).

**EPC** Electronic product code (see separate listing)

**ERP** Enterprise resource planning (see separate listing)

**ESFR** Early suppression fast response. Sprinkler system technology that executes faster and with a substantially greater volume of water. ESFR sprinklers may eliminate the need for in-rack sprinkler systems in many warehouses, thus reducing the cost of installation and, more importantly, the risk of water damage caused by damage to in-rack sprinklers. Retrofitting ESFR into older warehouses is not always feasible due to limited water pressure in old systems.

**Event management** software functionality that triggers specific actions based upon the occurrence of a specific event or combination of events. This is another one of those terms used primarily by software vendors and consultants to push "new" technology. In reality, business software has been providing event-management functionality for years. If inventory dropping below a predetermined level (reorder point) triggers a message to a planner (or even a listing on a reorder report), this is essentially event management.

**Excess Inventory** inventory quantities above a specific need. Some businesses may designate excess inventory as inventory beyond a certain time period of demand. For example, any inventory greater than 60 day's demand. Others may designate it as inventory beyond their current safety stock plus lot size (order quantity). The second method assumes you have formulas for adjusting safety stock and lot sizes as demand changes. This method basically calculates how much more inventory you have than you would have if you started with nothing and stocked based on current demand and ordering practices. You will generally use tolerances with the 2nd method. See also Obsolete Inventory

**Explosion-proof lift trucks** lift trucks designed to work in hazardous environments where highly combustible materials are present. Vehicles are designed to avoid sparks and components reaching combustible temperatures. Special electrical systems and materials are used to achieve this.

**Extrusion** generally describes an item made of metal or plastic that is produced by forcing the raw material through a die (extruding). The result being a long item with a uniform shape throughout the length. Extrusions will often (though not always) require cutting and other machining processes to turn them into a finished item.

**Fast Charging** Method for quickly recharging lift truck batteries on the vehicle during short periods where the vehicle is not being used (lunches, breaks, shift changes, etc). This process for "opportunity charging" eliminates the need to change batteries in multi-shift operations. Fast charging requires special chargers (called fast chargers). Fast chargers are significantly more expensive than standard battery chargers and there is still debate as to whether or not fast charging causes any harm to the batteries. The cost of the fast chargers can be offset by labor and equipment savings related to the elimination of changing batteries.

**Fast Moving Consumer Goods (FMCG)** description of common high volume products such as food, hygiene product, or cleaning supplies. These would be products that the average consumer would frequently purchase such as soda, toothpaste, or dish soap.

**FIFO** First-in-first-out. In warehousing describes the method of rotating inventory to used oldest product first. Actually an accounting term used to describe an inventory costing method. See LIFO

**Fill rate** Sales order processing measurement that quantifies the ability to fill orders. There are various ways of measuring fill rate. Line fill compares the number of line items shipped complete to the total number of lines ordered ( 95 line items shipped complete out of 100 lines ordered would result in a 95% line fill rate). Order fill compares the number of orders shipped complete to the total number of orders shipped. Other examples of fill rates would include dollar fill rate (comparing dollars shipped to dollars ordered), unit fill rate (comparing units shipped to units ordered). In fulfillment operations and some distribution operations where orders are generally shipped within 24 hours of receipt of order, fill rates reflect the ability to immediately ship from stock. In manufacturing operations and distribution operations that have lead-times for products, fill rates reflect the ability to ship to an agreed-to date. In these environments fill rate measurements are sometimes called On-time-and-Complete (OTC) or On-time Delivery (OTD) measurement. Tolerances are sometimes used in fill rate measurements to allow lines or orders that are not shipped complete but are within the tolerance to be considered as "shipped complete". The tolerances may be based on units, dollars, lines, or dates (shipped within certain tolerance of required date).

**Flex conveyor** portable conveyor that can be expanded, contracted, and flexed around curves. See Conveyor Pics.

**Floor load** a method of loading trucks, trailers, or containers where you load the goods directly on the floor rather than using pallets or other containers. Floor loading tends to be very labor intensive, but provides the greatest opportunity for utilizing the full cube of the truck, trailer, or container.

**Flow rack** racking system that incorporates sections of conveyor to allow the cartons or pallets to flow to the face of the rack. Stocking is performed from the rear of the rack. Also see Racking Pics Page.

**Flue space** See Longitudinal flue space and Transverse flue space.

**FMCG** Fast Moving Consumer Goods (see separate listing)

**Forecast** A Forecast is an estimation of future demand. Most forecasts use historical demand to calculate future demand. Adjustments for seasonality and trend are often necessary. Forecasting is all about turning unknowns into knowns (or reasonable approximations). For more info on forecasting, check out my book on inventory management.

**Forecast consumption** describes the method(s) your inventory management software uses to reduce forecasted demand by the actual demand that occurs during the forecast period. Incorrectly set up forecast consumption parameters or lack of functionality related to forecast consumption can often create serious problems with planning systems.

**Forecast error** the difference between the forecast quantity for a period and the actual demand experienced during that period. Forecast error is calculated after the period has passed and is used to evaluate the forecast and make adjustments.

**Forging** generally describes an unfinished item made of metal that is produced through a process that heats the metal (not to melting point) then uses pressure or hammering to change the shape of the metal into a shape that closely resembles the finished item that will ultimately be made (through machining processes) from the forging.

**Fork positioner** lift truck attachments that allow the operator to adjust the distance between the forks without getting off of the truck. Used primarily in high volume operations where there is a great variety of pallet and crate sizes handled.

**Forklift** a.k.a Fork Lift. See Lift Trucks.

**Forklift-free plants** a strategy to eliminate or reduce forklift use in operations. Used mainly in manufacturing operations, forklift-free usually involves finding ways to eliminate forklift use in specific areas (mainly the production areas). A key benefit is the safety of workers, but other benefits such as better space utilization and reduction of costs associated with lift trucks may also be factors.

**FTZ** Foreign Trade Zone (also known as Free Trade Zone), is similar to a Bonded Warehouse in that it has a special status that allows products to be imported into it without taxes or duties being paid. However, a Foreign Trade Zone actually has less restrictions placed upon it than a standard bonded warehouse and activities such as manufacturing can occur within an FTZ. Here is a nice link to a site that explains these difference in greater detail <http://www.inzone.org/?&section=basics&subsection=bonded> . Also see Bonded Warehouse

**Fulfillment** the activity of processing customer shipments. Though most manufacturing and warehouse operations will process customer shipments, this term usually refers to operations that ship many small orders (usually parcels) to end users as opposed to operations that process larger shipments to other manufacturers, wholesalers, or resellers. Examples of fulfillment operations would include operations that process shipments for mail-order catalogs, internet stores, or repair parts.

**Gaylord** a large corrugated container usually sized to match the length and width dimensions of a pallet. Gaylord is actually a trade name that has become synonymous with this specific type of container. Alright Beavis, you can stop snickering now.

**GMA pallet** Also known as a Grocery Pallet, a GMA pallet is made to the specifications of the Grocery Manufacturer's Association. It is basically a 4-way pallet that is 40 inches wide, by 48 inches deep, by 5 inches in height and has the deck boards and bottom boards mounted flush with the outside stringers (more detailed specs are available from the Grocery Manufacturer's Association). Also see Pallet

**Gravity conveyor** types of conveyor that use gravity to move materials. Skatowheel conveyor and roller conveyor are the most common types of gravity conveyor used, however, even a simple steel chute is essentially a gravity conveyor.

**GROII** Gross Margin Return on Inventory Investment. Calculation that shows your margin relative to your average inventory investment. Calculated by dividing your annual gross margin (dollars) by your average inventory (dollars). Particularly useful in determining which items provide the greatest profit potential relative to your investment in inventory. As with all calculations that use "gross margin" as an input, the output may be flawed if other costs not included in the gross calculation may vary significantly from one item to another.

**Guidance systems** Guidance systems are used to guide automated guided vehicles through plants, guide lift trucks in very-narrow-aisle storage areas. Wire-guided and Rail-guided tend to be the most common guidance systems, but others including laser, optical systems, and magnetic tape are also available. See also Wire-guided, Rail-guided, Laser-guided, Optical-guided.

**High-density storage** describes storage methods where unitized loads are stored more than one unit deep and/or high. Stacked bulk floor storage, drive-in/drive-thru rack, push-back rack, flow rack, and, to a lesser extent, double-deep rack, are examples of high-density storage.

**High-piled combustible storage** term used in fire codes to refer to codes relating to floor or racked storage exceeding 12 feet in height or high-hazard commodity storage exceeding 6 feet in height. See article Warehouse Fire Safety,

**Honeycombing** refers to the unused pallet positions in high-density storage that result when the number of unit-loads for an item does not completely fill the storage lane. Since mixing SKUs in high-density storage is normally not done, these unused pallet positions are not available to store other materials.

**Impact alarm** a.k.a shock alarm, shock switch. Impact alarms are devices that can be attached to lift trucks to sense impacts (collisions). The reality of impact alarms is not near as wonderful as the concept. See my article on Lift Truck Safety for more details.

**Inbound and outbound quantities** in multi-branch environments, inbound and outbound quantities reflect open quantities on interbranch transfer orders.

**Inching pedal** on lift trucks with internal combustion (gasoline, liquid propane, diesel) engines it is necessary to rev the engine in order to get the power needed to lift a load with the

hydraulics. An inching pedal acts like a combination of a clutch pedal and brake pedal. When slightly depressed, it puts the transmission in neutral allowing the operator to rev the engine. When completely depressed it engages the brakes. An inching pedal may be a separate pedal from the brake pedal or be part of the main brake pedal.

**Independent Demand** demand generated from forecasts, customer orders or service parts.

**Industrial Truck** vehicles used for industrial purposes. Generally used to transport materials and personnel within industrial facilities. Lift trucks (forklifts) are the most well known type of industrial truck.

**Intermodal** transportation term describing the use of multiple modes of transportation for a shipment. Ocean containers that are picked up by a truck, delivered to port, transported by ship, and then picked up by another truck are a common example of intermodal transportation. In the trucking industry, intermodal usually refers to the combination of trucking and rail transportation.

**Inventory** any quantifiable item that you can handle, buy, sell, store, consume, produce, or track can be considered inventory. This covers everything from office and maintenance supplies, to raw material used for manufacturing, to semi-finished and finished goods, to fuel used to power equipment used in the business.

Inventory management the direction and control of activities with the purpose of getting the right inventory in the right place at the right time in the right quantity in the right form at the right cost.

**Inventory Turn** number of times inventory is consumed or sold during a one year period. Generally calculated by dividing the average inventory level (or current inventory level) into the annual inventory usage (annual Cost of Goods Sold). In my opinion, Inventory Turns is probably the most overused, misused, and abused inventory metric. That's primarily because it doesn't really tell you a hell of a lot, yet companies insist on building order policies on it.

**Item** see SKU

**Item Profile** data that describes the characteristics of an item. May include physical characteristics such as size and weight, transactional characteristics such as times sold/consumed and units sold/consumed, or group characteristics such as sales channel, commodity, hazardous classification, etc. Item profiles are used in warehouse design and slotting.

**Jackpot Line** this is one of those funky terms that has somehow achieved widespread acceptance in the material handling industry. Usually used with automated systems such as automated conveyor systems, a Jackpot Line refers to an area where exceptions are routed. Exceptions may include orders that could not be completed (shortages or WMS error), orders

requiring special processing, or weight or size exceptions. The terms Jackpot Lane, or Jackpot Area are also used to describe similar exception areas.

**JIT** Just-in-time. Term usually thought of as describing inventory arriving or being produced just in time for the shipment or next process. Actually, JIT is a process for optimizing manufacturing processes by eliminating all process waste including wasted steps, wasted material, excess inventory, etc.

**Just-in-sequence** A combination of just-in-time delivery with production line sequencing of delivered items. A customer will notify a supplier of the items needed and the sequence based on the customer's manufacturing schedule, the supplier will then put together the shipment with the items in the appropriate sequence and deliver them to the customer (sometimes directly to the assembly line). This is most common in the automotive and similar assembly line industries where each unit on the assembly line can be configured differently (component options).

**Kanban** used as part of a Just-In-Time production operation where components and sub-assemblies are produced based upon notification of demand from a subsequent operation. Historically, Kanban has been a physical notification such as a card (kanban cards) or even an empty hopper or tote sent up the line to the previous operation. Kanban is actually a simplistic means of both signaling the need for inventory as well as controlling the inventory levels (by limiting kanban cards or containers).

**Landed Cost** inventory costing method that includes the purchased cost plus transportation costs, import fees, duties, taxes, and other costs incurred in obtaining the inventory.

**Laser scanner** device that uses a moving laser to read bar codes. Devices can be portable hand-held units, or fixed units.

**Laser-guided** guidance system used with AGVs that uses a rotating laser (mounted on top of the vehicle) to determine the vehicles location. Reflective targets need to be strategically placed along the vehicle's route. Must always maintain clear line-of-site to reflective targets for the system to work properly.

**Lead time** amount of time required for an item to be available for use from the time it is ordered. Lead time should include purchase order processing time, vendor processing time, in transit time, receiving, inspection, and any prepack times. However, based on the way many inventory systems work, there may be problems incorporating internal factors such as post-receipt processing in Lead-time, so in many systems, the lead time just represents the period of time from which the item is ordered to the time it arrives at your dock. Also see Effective Lead Time.

**Lead-time demand** forecasted demand during the lead-time period. For example, if your forecasted demand is 3 units per day and your lead time is 12 days, your lead-time demand would be 36 units.

**Lean manufacturing** alternate term used to describe the philosophies and techniques associated with Just-in-time (JIT) manufacturing.

**Legacy system** implies a business computer/information system that is old or outdated. Often used to describe home-grown (custom built) mainframe systems, however, software companies will use the term legacy system to define any system that is not based on the current version of a business software package.

**Less-than-truckload** transportation term that describes shipments that are less than a trailer load in size. LTL also is used to describe the carriers that handle these loads. LTL carriers generally use strategically placed hubs to sort and consolidate LTL shipments into full-truck-load shipments.

**License Plate** License plates are often used with warehouse management systems. They are basically an ID number placed on a pallet, tote, carton or other container, and are used to track the contents of that container as it moves through the warehouse. The license plate will almost always have a bar code that contains this ID number. So by scanning a single bar code on the pallet you can initiate or complete movement transactions for all items and quantities on that pallet.

**LIFO, Last-in-first-out** in warehousing, describes the method for using the newest inventory first (I've never seen an operation that uses this). In accounting, it's a term used to describe an inventory costing method. See FIFO

**Lift truck** vehicles used to lift, move, stack, rack, or otherwise manipulate loads. Material handling workers use a lot of terms to describe lift trucks; some terms describe specific types of vehicles, others are slang terms or trade names that people often mistakenly use to describe trucks. Terms include, industrial truck, forklift, reach truck, motorized pallet trucks, turret trucks, counterbalanced forklift, walkie, rider, walkie rider, walkie stacker, straddle lift, side loader, order pickers, high lift, cherry picker, Jeep, Towmotor, Yale, Crown, Hyster, Raymond, Clark, Drexel. See Lift Truck Pics and articles on Lift Truck Basics and Lift Truck Safety for more info.

**Lights-out warehouse** a.k.a. Lights-out facility. Describes fully-automated facilities. The idea being that if the facility requires no human operators, you can run it with no lights. Use of AS/RS units, AGVs, automated conveyors, robots, etc makes this possible.

**Line item** a single detail record. The term line item is most commonly used to describe the detail (each line that reflects an item and a quantity) on sales orders or purchase orders. For example, if a customer orders 20 red pens, 50 black pens, and 10 green pens, this equates to an order with three line items.

**Load** in manufacturing, describes the amount of production scheduled against a plant or machine. In warehousing, describes the materials being handled by a piece of equipment. In transportation, describes the materials being transported.

**Load locks** adjustable support bars used inside trailers to prevent movement of the load. a.k.a Load bars, Cargo bars

**Locator system** locator systems are inventory-tracking systems that allow you to assign locations to your inventory to facilitate greater tracking and the ability to store product randomly. Prior to locator systems, warehouses needed to store product in some logical manner in order to be able to find it (stored in item number sequence, by vendor, by product description, etc.) By using locator systems you can increase space utilization by slotting your product by matching the physical characteristics of the product to a location whose physical characteristics match that of the product. You can also increase productivity by locating fast moving product to closer, more accessible locations, and increase accuracy by separating similar items. Location functionality in software can range from a simple text field attached to an item that notes a single location, to systems that allow multiple locations per item and track inventory quantities by location. Warehouse management systems (WMS) take locator systems to the next level by adding functionality to direct the movement between locations. See article on Warehouse Management Systems, also check out My book on inventory accuracy which covers locator systems in more detail. . a.k.a. Location system, Bin locations

**Lockout / Tagout** the process of disabling (lockout) and identifying (tagout) equipment and energy sources during maintenance or service to prevent injury of personnel from an unexpected startup or power up.

**Longitudinal flue space** term used by fire codes to describe the space between the rows of back-to-back racking. Flue spaces allow the water from an overhead sprinkler system to reach lower levels of the rack. Normally a longitudinal flue space of at least 6 inches is required. It is important to note that the flue space is measured as the distance between the loads, not the distance between the racks. Also see Transverse Flue Space See article Warehouse Fire Safety,

**Lot for lot** an order method that is driven by forecast periods. Order quantities will match demand in each specific forecast period.

**Lot size** also known as order quantity, lot size represents the quantity of an item you order for delivery on a specific date, or manufacture in a single production run. For more info on lot sizing, check out my book on inventory management.

**LTL** Less-than-truckload (see separate listing)

**Manufacturing execution system** software systems designed to integrate with enterprise systems to enhance the shop-floor-control functionality that is usually inadequate in ERP

systems. MES provides for shop floor scheduling, production and labor reporting, integration with computerized manufacturing systems such as automatic data collection and computerized machinery.

**Man-up** term used to describe lift trucks designed to raise the operator with the load. Order selectors and turret trucks are the most common types of man-up vehicles.

**Master production schedule (MPS)** Production schedule specifying specific items, quantities, and dates at which production is expected to take place. The primary purpose of an MPS is to manage capacity when you have some time periods where demand is expected to exceed capacity. You will then use MPS to produce some products in advance of demand (forecasted or actual orders) during periods when capacity exceeds demand.

**MES** Manufacturing execution system (see separate listing)

**Mezzanine** a tiered structure within a building used to provide worker access to various levels. Mezzanines can be free-standing structures supported by posts and trusses, or can be a series of walkways supported by storage equipment (rack-supported mezzanine).

**Milk run** There are many variations on the definition of this term but basically a milk run consists of a pickup and/or delivery route where several stops are made. Usually it refers to a regularly run route, but it may also refer to a one-time run where several stops are made. Some consider a milk run to mean a route where shipments are delivered and inbound materials picked up in the same run.

**Min-max** a simplistic inventory system in which a minimum quantity and maximum quantity are set for an item. When the quantity drops below Min you order up to the Max. Also see Optional replenishment.

**Motorized pallet truck** motorized pallet trucks are the motorized version of the pallet jack. They come in "Walkie" versions or "Rider" versions. As you would expect, the walkie is designed for the operator to walk along with the truck as they move loads, while the rider has a small platform that the operator stands on. The riders work great for frequent moving of loads over extended distances within warehouses and manufacturing operations. a.k.a. Walkie, Walkie-rider, Rider.. Also see Lift Truck Pics and Lift Truck Basics for more info

**MPS** Master production schedule (see separate listing)

**MRO** Maintenance, repair, and operating inventory. Inventory used to maintain equipment as well as miscellaneous supplies such as office cleaning supplies.

**MRO** Maintenance, repair, and operating inventory (see separate listing)

**MRP generation** A term used to describe the running of the programs that convert demand into planned orders. Depending on the operation, MRP Generation may be run daily,

weekly, or even monthly. Since this processing requires a lot of system resources it is generally confined to off hours or weekend processing.

**MRP/MRP II** Manufacturing resource planning—process for determining material, labor and machine requirements in a manufacturing environment. MRP II is the consolidation of Material Requirements Planning (MRP), Capacity Requirements Planning (CRP), and Master Production Scheduling (MPS). MRP was originally designed for materials planning only. When labor and machine (resources) planning were incorporated it became known as MRP II. Today the definition of MRP II is generally associated with MRP systems.

**Narrow aisle** describes lift trucks that operate in aisles of 8' to 10'. Narrow-aisle trucks are generally stand-up vehicles such as reach trucks. Also see Vary Narrow Aisle (VNA) and read article [The Aisle Width Decision](#)

**Negative inventory** an inventory system (computer) condition whereby the on-hand inventory balance is listed as a quantity less than zero. Check out my article on [negative inventory](#)

**Normal distribution** term used in statistical analysis to describe a distribution of numbers in which the probability of an occurrence, if graphed, would follow the form of a bell shaped curve. This is the most popular distribution model for determining probability and has been found to work well in predicting demand variability based upon historical data.

**Obsolete Inventory** inventory that has had no sales or usage activity for a specific period of time. The period of time varies by company and industry and may even vary by product line within a specific company and may range from weeks to years. a.k.a . Dead Inventory. See also [Excess Inventory](#)

**Open Source** Software that has the source code freely available for modification. In most cases, open source software is also "Free software" in that it requires no licensing fees. The Linux operating system, Apache web server, PHP programming language, MySQL database, and OpenOffice office suite are among the best known free open source products. However, when it comes to business software (such as ERP systems), I've noticed that some of the products that advertise (that's a clue) as open source, are not exactly free. Some have licensing fees, while others are built on databases or other programs that have licensing fees.

**Operation** I use the term operation frequently in my writings with two very distinct meanings. At a general level, an operation is the overall work environment that includes the facility(s) and all activities that occur within it. When discussing MRP and related topics, an operation is a specific step that exists in the routing of a manufacturing process.

**Optical-guided** guidance system that uses a special strip (taped or painted) on the floor to guide an AGV.

**Optional replenishment** the action of ordering or producing up to the Max in a Min-Max system even though inventory has not reached the Min. May be used to avoid down time on machines etc.

**Order cost** also known as purchase cost or set up cost, order cost is the sum of the fixed costs that are incurred each time an item is ordered. These costs are not associated with the quantity ordered but primarily with physical activities required to process the order. For purchased items, these would include the cost to enter the purchase order and/or requisition, any approval steps, the cost to process the receipt, incoming inspection, invoice processing and vendor payment, and in some cases a portion of the inbound freight may also be included in order cost. In manufacturing, the order cost would include the time to initiate the work order, time associated with picking and issuing components excluding time associated with counting and handling specific quantities, all production scheduling time, machine set up time, and inspection time. Order cost is used as part of most cost-based order quantity/lot sizing calculations. See article on EOQ for more detailed info on order cost.

**Order cycle** also called replenishment cycle, order cycle refers to the time between orders of a specific item. Most easily calculated by dividing the order quantity by the annual demand and multiplying by the number of days in the year.

**Order point** see Reorder point

**Order profiled** Data describing the characteristics of inbound, outbound, or internal orders (outbound is most common). Examples of characteristics incorporated into an order profile could include: line items per order, pieces per order, weight per order, cube per order, time of day, destination, shipment method, order type, etc. Characteristics are often broken into logical groups such as breaking line items per order into groups of 1 line item, 2-4 line items, 5-10 line items, 11- 25, 26+.

**Order selector** a.k.a. Order Picker. Lift truck designed specifically for manual handling of less than pallet load quantities in racking. Man-up design has fixed forks attached to a platform that elevates the load and the operator to facilitate manual loading and unloading from racking. Order selectors are very-narrow-aisles vehicles that operate in aisles of less than 6' Also see Lift Truck Pics, Lift Truck Basics, and The Aisle Decision for more info.

**Outside operation** term describing a step in the manufacturing process that is performed by an outside vendor. System setup for outside operations can get fairly complicated and generally requires linking a purchase order for the outside processing to a specific operation in the routing. The integration of the purchase order process and the work order process to ensure accounting, production planning, and inventory management's needs are met can be confusing and is often problematic

**Pallet** a portable platform designed to allow a forklift or pallet jack to lift, move, and store various loads. Most pallets are made from wood , but pallets are also made from plastic, steel,

and even paper-based materials. Spec'ing a wood pallet involves identifying wood type (hardwood or softwood), overall pallet size, number and size and spacing of stringers, whether stringers are to be notched for 4-way use, number and size and spacing of deckboards, number and size and spacing of bottom boards, whether deck boards and bottom boards are attached flush with outside stringers or overhang outside stringers. Other options include using a solid deck (rather than separate deck boards), chamfering the deck boards, using treated wood (for international shipments). 2-way pallets allow entry by a forklift from the front or back of the pallet, 4-way pallets have the stringers notched (or use a blocking system instead of stringers) so a forklift can also enter the pallet from either side. The most common sized pallet is the GMA (Grocery Manufacturer's Association) pallet, also called a grocery pallet. It is a 4-way pallet that is 40 inches wide, by 48 inches deep, by 5 inches in height and has the deck boards and bottom boards mounted flush with with the outside stringers. Also see Skid.

**Pallet inverter** a type of stationary equipment used to transfer product between different types of pallets such as transferring from wood to plastic pallets, or from pallets to slipsheets. A load on a pallet is placed in the pallet inverter and the entire load is rotated 180 degrees allowing you to remove the original pallet and replace it with another.

**Paperless** when referring to processing in the warehouse (paperless picking, paperless receiving) or on the shop floor, paperless generally suggests that the direction of tasks and execution of transactions are conducted electronically without the use of paper documents. This is usually accomplished through the use of fixed or portable computers, bar code scanners, RFID readers, light-signaling technology (pick-to-light), or voice technology. Or maybe it just means you ran out of paper.

**Paper-roll clamp** designed specifically for the handling of large paper rolls, the paper roll clamp is a lift truck attachment that clamps around the roll and also allows for a full 360 degree rotation.

**Period order quantity** an order method that uses a fixed period of time to calculate order quantities. Period order quantity is generally stated in days and will be compared to the forecast at time of reorder to calculate the appropriate order quantity.

**Phantom bill of material** a fictitious bill of material created for common subassemblies or kits that you do not want to produce as separate items. For example, if you have a number of products that all use the same hardware kit you can create a phantom bill for the hardware kit and then just put the phantom item on the bills for all products that use it. Your MRP system will treat the phantom bill components as though they were part of the bill for the higher level item (rather than treating it as a separate item that needs to be produced). Phantom items never actually exist, they are just a means for simplifying the management of your bills of materials.

**Physical inventory** refers to the process of counting all inventory in a warehouse or plant. Operations are usually shut down during a physical inventory. See physical inventory page at [accuracybook.com](http://accuracybook.com) for more information, also read my article on physical inventories.

**Pick module** can describe anything from a large area of a warehouse designated for order picking (such as a multi-level mezzanine picking area) to the individual sections of flow rack or other storage media that make up the picking area. I think the implication here is that a "pick module" somehow has a level of sophistication above that of a "warehouse area used for order picking". It's really just a marketing term used by equipment suppliers and consultants to try to impress their clients.

**Pick-and-pass** see Zone Picking

**Pick-to-carton** for parcel shippers, pick-to-carton logic uses item dimensions/weights to select the shipping carton prior to the order picking process. Items are then picked directly into the shipping carton. When picking is complete, dunnage is added and the carton sealed eliminating a formal packing operation. This logic works best when picking/packing products with similar size/weight characteristics. In operations with a very diverse product mix it's much more difficult to get this type of logic to work effectively.

**Pick-to-clear** method often used in warehouse management systems that directs picking to the locations with the smallest quantities on hand.

**Pick-to-light** pick-to light systems consist of lights and LED displays for each pick location. The system uses software to light the next pick and display the quantity to pick. Pick-to-light systems have the advantage of not only increasing accuracy, but also increasing productivity. Since hardware is required for each pick location, pick-to-light systems are easier to cost justify where very high picks per SKU occur. Carton flow rack and horizontal carousels are good applications for pick to light. In batch picking, put-to-light is also incorporated into the cart or rack that holds the cartons or totes that you are picking into. The light will designate which order you should be placing the picked items in. See article on Order Picking, also check out My book on inventory accuracy.

**Pinwheel** see Pinwheeling

**Pinwheeling** refers to a method for loading trailers where you alter the direction of every other pallet. Basically you use pinwheeling to load more pallets on a trailer when the depth of the pallet is longer than half the trailer width, but the depth plus the width is less than the trailer width. You can also use it as a productivity/space utilization compromise or to reduce load shifting when loading pallets where the depth of the pallet is less than half the trailer width. See article on Trailer Loading Techniques.

**Planned order** term used within MRP and DRP systems for system-generated planned order quantities. Planned orders only exist within the computer system and serve multiple functions. One function is to notify the materials/planner or buyer to produce or order materials, which is done by converting a planned order into an purchase order, shop order, or transfer order. Another function is used by the MRP or DRP system to show demand which is used by subsequent MRP and DRP programs to generate additional planned orders. (MRP/DRP

systems sometimes run several programs in a specific sequence to generate all planned orders, one program may convert forecasts or customer orders into planned orders which creates the demand the next program uses this demand to create additional planned orders).

**Planning bill** see Planning bill of material

**Planning bill of material** a fictitious bill of material used to group options of a family of products. For example, you may have a line of notebook computers whereby most of the components are the same, but some will have different hard drives, processors, memory, etc. Rather than creating separate bills for each possible combination and then forecasting each possible combination, you create one large planning bill that contains all possible components but uses the "quantity per" to manage the options. If you expect half of the computers to have 40 GB drives, 25% to have 60GB drives, and 25% to have 80 GB drives, you would set up each drive on the bill and use 0.50, 0.25, and 0.25 respectively as the quantity per. You would then proceed to do the same for all other options. Your higher level forecast would be for the total demand for all computers in this family. Planning bills are sometimes referred to as Super Bills or Pseudo Bills.

**PLC** Programmable logic controller. Computerized device used to control functions of machines. PLCs are used in automation of manufacturing equipment and material handling equipment such as automated conveyor systems.

**Plugging** plugging is used with electric industrial vehicles to reduce speed, stop, or change direction, without using the brake. Most commonly used with vehicles with hand throttles such as motorized pallet trucks and order selectors, the operator simply switches between forward and reverse to control speed. Though this sounds like something you shouldn't be doing, many electric trucks are designed to allow for this.

**Pop-up sorter** sorting equipment integrated into conveyor to move materials off of conveyor at fixed points. Pop-up sorters are installed in fixed positions and may consist of a series of wheel or small belts that are normally located slightly below the conveyor rollers. The wheels or belts are momentarily raised (pop up) to enable diverting materials off of the conveyor.

**Postponement** a Manufacturing / Distribution strategy where specific operations associated with a product are delayed until just prior to shipping. Storing product in a generic state and then applying custom labels or packaging before shipping is an example of postponement.

**Powered industrial truck** according to OSHA, a "powered industrial truck is defined as a mobile, power-driven vehicle used to carry, push, pull, lift, stack, or tier material". Pretty much covers any type of lift truck as well as vehicles used to tow materials. See Lift Truck

**Pro forma invoice** basically a fake invoice created to show a buyer what the details of the actual invoice will look like. You can think of it as a draft invoice. Pro forma invoices are commonly used with international transactions to provide the buyer with the information they

will need to pay for the goods (prepayment is common with international transactions) and arrange for import.

**Process manufacturing** type of manufacturing where a product is produced or transformed through mixing, chemical reactions, etc. Examples of process manufacturing would be refining crude oil into gasoline, extracting copper from ore, combining materials to make paint. Process as opposed to discrete manufacturing. Also see Discrete manufacturing.

**Production plan** generally used to describe a long-term plan of what will be produced at a family level.

**Program generator** program generators are software programs that generally provide graphical user interfaces and tools that allow a user to create a program without having to write actual computer code. Currently these programs are more frequently referred to as "Development Tools" and are usually designed to write code for specific applications such as data-collection programs for portable computers. While a user does not need to be a programmer to use this software, the user does need to have a higher level of technical skills than that of most standard software users. a.k.a. Code generator, Development tools

**Proprietary** used to describe equipment or technologies that do not follow an open standard design that would allow them to easily integrate with other equipment or technologies. Proprietary equipment and technologies are usually patented or otherwise protected making it difficult or impossible for other companies to offer similar or complementary products.

**Psuedo bill of material** see Planning bill of material

**Public warehouse** a business that provides short or long-term storage to a variety of businesses, usually on a month-to-month basis. A public warehouse will generally use their own equipment and staff, however, agreements may be made where the client either buys or subsidizes equipment. Public warehouse fees are usually a combination of storage fees (per pallet or actual sq. footage) and transaction fees (inbound and outbound). Public warehouses are most often used to supplement space requirements of a private warehouse. Also see Contract Warehouse and 3PL

**Purchase order** a document used to approve, track, and process purchased items. A purchase order is used to communicate a purchase to a supplier. It is also used as an authorization to purchase. A purchase order will state quantities, costs, and delivery dates. The purchase order is also used to process and track receipts and supplier invoices/payments associated with the purchase..

**Push sorter** a very simple fixed-position sorting device used with conveyor systems. A push sorter may use a swinging arm or a simple piston-type pushing device to push materials across the conveyor.

**Push-back rack** racking system that incorporates a carriage or other sliding device to allow you to feed multiple pallets into the same location "pushing back" the previous pallet. Also see Racking Pics Page.

**Put-to-light** technology similar to pick-to-light, however, the light modules are used to direct which tote, bin, or carton, the item is to be picked into, rather than directing which locations to pick from.

**Quantity** There are various quantity elements in perpetual inventory systems. Below are definitions of the most common. Be aware that these definitions are fairly generic and that specific inventory systems may use completely different definitions or terminology.

**Quantity allocated** also known as committed quantity, commitments, or allocations. Quantity allocated is the quantity that is on current open sales orders or production orders (as components), and may be relative to a specific time period. Also see Allocations

**Quantity available** is the result of a calculation that takes quantity on hand and reduces it by allocations (for sales orders, manufacturing orders, etc). Quantity available may or may not be date specific and therefore take into account future receipts. Quantity available calculations are sometimes very complicated and vary from one software product to another.

**Quantity in transit** in multi-branch environments, quantity in transit reflects the quantity that has been shipped from one branch/facility to another branch/facility, but has not yet been received by that branch/facility. In operations that use advanced tracking of receipts, it may reflect quantities that have been shipped by outside vendors, but not yet received.

**Quantity on hand** also known as onhand quantity, in stock, store quantity. Quantity on hand describes the actual physical inventory in the possession of the business. When inventory is received or produced, it is added to quantity on hand, when inventory is sold or consumed, it is removed from quantity on hand.

**Quantity on order** includes quantity on open purchase orders or manufacturing orders. May or may not include quantities on transfer orders from other branches.

**Queue time** amount of time a job waits at an operation prior to set up or processing. Part of manufacturing lead time.

**Rack-supported building** warehouse design that uses structural pallet rack to support the roof of a building, eliminating the need for posts. Rack-supported buildings are usually designed for AS/RS systems or turret truck systems where racking is 40 to 100 ft in height.

**Radio frequency** in warehousing, refers to the portable data collection devices that use radio frequency (RF) to transmit data to host system.

**Radio frequency identification** see RFID

**Rail-guided** guidance system used with very-narrow-aisle vehicles such as order selectors and turret trucks. A steel rail is mounded on each side of the aisle, and rollers are mounted on the lift truck to guide it between the rails.

**Random location storage** refers to storage method where a product may be stored in any location. Random storage has higher space utilization and generally lower accuracy than fixed location storage

**Reach truck** a.k.a. Stand-up reach, Straddle reach, Double-deep reach. The reach truck is a narrow-aisle (8'-10') lift truck designed specifically for racked pallet storage. It consists of outriggers in front and telescoping forks that use a hydraulic scissors-type mechanism that allow you to pick up the load and retract it over the outriggers reducing the overall truck and load length, allowing you to turn in a narrower aisle. Double-deep reach trucks use an extended reach mechanism that allows you to store pallets two-deep in specially designed double-deep rack. Reach trucks are designed for racking areas only and do not work for loading trucks or quickly moving loads over distances. Also see [Lift Truck Pics](#) and [Lift Truck Basics](#) for more info.

**Real-time locator system** real-time locator system (RTLS) uses RFID technology that provides the objects they are attached to the ability to transmit their current location. System requires some type of RFID tag to be attached to each object that needs to be tracked, and RF transmitters/receivers located throughout the facility to determine the location and send information to computerized tracking system. While it sounds like a great way to eliminate "lost" inventory, the systems are still too costly for most inventory tracking operations and are more likely to be used to track more valuable assets.

**Reorder point** The inventory level set to trigger reorder of a specific item. Reorder point is generally calculated as the expected usage (demand) during the lead time plus safety stock. Fixed reorder point implies the reorder point is a static number plugged into the system. Dynamic reorder point implies there is some system logic calculating the order point. Generally this would be comparing current inventory to the forecasted demand during the lead time plus safety stock.

**Replenishment cycle** see Order Cycle

**Reverse logistics** Reverse Logistics covers activities related to returned product, returned pallets and containers, returned materials for disposal or recycling.

**RFID** Radio frequency identification. Refers to devices attached to an object that transmit data to an RFID receiver. These devices can be large pieces of hardware the size of a small book, like those attached to ocean containers, or very small devices inserted into a label on a package. RFID has advantages over barcodes, such as the ability to hold more data, the ability to change the stored data as processing occurs, does not require line-of-site to transfer data and is very effective in harsh environments where bar code labels won't work. Read my articles [ADC Basics](#)

and RFID Update, also check out My book on inventory accuracy and its related RFID Updates and RFID Links.

**Roller conveyor** type of conveyor that uses rollers to move materials. Roller conveyor may be automated (live roller) or simply use gravity (gravity roller) to move materials. See Conveyor Pics.

**Rough-cut capacity** used to determine estimated load on key pieces of equipment or resources. May use production plan or master production schedule. Rough-cut capacity is used as a check to verify that manufacturing resources are adequate to execute the production plan.

**Routing** used in conjunction with the bill of material in manufacturing operations. While the BOM contains the material requirements, the routing will contain the specific steps required to produce the finished items. Each step in the routing is called an operation, each operation generally consists of machine and labor requirements.

**RTLS** Real-time locator system (see separate listing)

**Safety lead time** safety lead time is a way to represent your safety stock as a number of days demand. Safety lead time can be beneficial when you want to “pad” your lead-time to compensate for supplier variability, transportation variability, or internal process variability. For example, if it can take 2 or 3 days to get incoming materials processed through your receiving process, you may want to set your safety lead time to 2 or 3 days. This will calculate the requested dates for your purchase orders 2 or 3 days earlier than actual need. This is much cleaner than adding the 2 to 3 days to the supplier's lead time (which can be confusing when the supplier's stated lead-time is different from what is in your system).

**Safety stock** quantity of inventory used in inventory management systems to allow for deviations in demand or supply. Safety stock calculations will take into account historic deviations and use a required service level multiplier to determine the optimal safety stock level. For more info on safety stock, check out my book on inventory management and my article on safety stock.

**Screen mapping** software that provides the functionality to change the arrangement of data fields on a computer screen that accesses a mainframe computer program. Screen Mapping is frequently used in combination with terminal emulation software to "Remap" data fields from a standard mainframe program to be used on the smaller screen of a portable handheld device. . a.k.a. Screen scraping

**Seasonality** fluctuations in demand that repeat with the same pattern over equivalent time periods.

**Seasonality index** consists of a number for each specific forecast period that describes the relationship of each period's demand to the average demand (level) over the complete seasonal

cycle. A seasonality index is used to adjust the forecast to account for these cyclical changes in demand. The average demand is represented by the number "1". If seasonality for a period results in demand greater than the average demand, it will be represented by a number greater than 1. For example, if December's sales were, on average, 30% greater than the average monthly sales for the year, you would have a seasonality index of 1.3 ( 1 plus .30) for December. If January's sales were, on average, 20% less than the average monthly sales for the year, you would have a seasonality index of 0.8 (1 minus .20).

**Selective pallet rack** the term selective pallet rack implies standard single-deep pallet rack configurations (and rack designs) where each pallet is immediately accessible from an aisle. In contrast to double-deep rack, drive-in or drive-thru rack, or push-back rack where some loads will be stored behind other loads. See Equipment Pics: Racking page for examples.

**Service factor** factor used as a multiplier with the Standard Deviation to calculate a specific quantity to meet the specified service level. See article on safety stock for more information on service factor

**Shipping manifest system** software used to associate shipments with carrier, service, rate, etc. Shipping manifest systems will produce a report (physical or electronic) that is sent to the carrier to be used for billing purposes. Shipping systems will usually produce shipping documents such as compliance shipping labels, bill of lading, Export documents, and Hazmat documentation. They may also have functionality related to rate shopping, freight policy execution, freight cost management. Also see Transportation Management System.

**Sideshift** a very common lift truck attachment, the sideshift device allows the fork carriage to slide left and right to allow more accurate placement of the load. Sideshifts will increase productivity and safety as well as reduce product damage by allowing the operator more flexibility in load placement.

**Skatewheel conveyor** type of conveyor that uses small wheels (usually made of steel) to move materials. See Conveyor Pics.

**Skid** a portable platform designed to allow a forklift, pallet jack, or other material handling equipment lift, move, and store various loads. A skid is similar to a pallet but does not have bottom deck boards. A skid is preferred over a pallet when used with equipment that would have problems with the bottom deck boards. The down side is that a skid usually needs beefier materials (more expensive and heavier) in order to meet the strength requirements of a comparable pallet. Though not technically correct, the terms Skid and Pallet are often used interchangeably. Also see Pallet

**SKU** Stock keeping unit—referring to a specific item in a specific unit of measure. For example, if you distributed thirty-weight motor oil in both quarts and gallons you would maintain the inventory as two SKUs even though they are both thirty-weight motor oil. Also refers to the identification# assigned to each SKU.

**Slap-and-ship** term used to describe an approach to complying with customer requirements for physical identification of shipped goods. Most recently, slap-an-ship has been used to describe complying with RFID requirements (such as those from Wal-Mart), however, it is also applicable to any compliance labeling requirement (such as compliance bar code labels). Slap-and-ship implies you are meeting the customer's requirement by applying the bar code labels or RFID tags, but are not utilizing the technology internally.

**Slide-shoe sorter** type of conveyor sorting equipment that uses a series of sliding shoes to move materials off of the conveyor. The sliding shoes are part of the conveyor and travel with the materials, when the sorting point is reached, a several shoes will slide across the conveyor, pushing the materials onto another conveyor or down a chute.

**Slip-sheet attachment** lift truck attachment used where slip sheets (a sheet of cardboard, paperboard, or plastic) are used rather than pallets. The slip-sheet attachment has a push/pull mechanism that clamps onto the slip sheet and pulls the load onto a thin platform and then pushes the load off of the platform when the truck reaches the destination.

**Slotting** the activities associated with optimizing product placement in pick locations in a warehouse. There are software packages designed just for slotting, and many WMS packages will also have slotting functionality. Slotting software will generally use item velocity (times picked), cube usage, and minimum pick face dimensions to determine best location.

**Speech-based technology** also known as voice technology is actually composed of two technologies: Voice directed, which converts computer data into audible commands, and Speech recognition, which allows user voice input to be converted into data. Portable voice systems consist of a headset with a microphone and a wearable computer. See article on ADC for more info, also check out My book on inventory accuracy which provides greater detail on speech-based systems.

**Stamping** generally describes an unfinished item made of metal that is produced through a process that uses pressure to form discrete units from larger raw materials. Also describes the process used to produce stampings. In some cases, stampings may also be referred to as "blanks".

**Standard cost** inventory costing method used in manufacturing environments that uses the materials costs in the bill of materials combined with the labor costs (based on standard labor hours and rates per operation) and machine costs in the routing to calculate the cost of the finished or semi-finished item.

**Standard deviation** Used to describe the spread of the distribution of numbers. Standard deviation is calculated by the following steps: determine the mean (average) of a set of numbers, determine the difference of each number and the mean, square each difference, calculate the average of the squares, calculate the square root of the average. You can also use

**Excel function**            STDEVPA to calculate standard deviation. In safety stock calculations the forecast quantity is often used instead of the mean in determining standard deviation.

**Straddle trucks**            lift trucks that incorporate outriggers set wide enough to allow a pallet to fit between them. Common examples would include straddle reach trucks and straddle stackers.

**Straight truck**    delivery trucks that do not have a separate tractor and trailer. Straight trucks (also called box vans, or box trucks) usually only have 2 axles and generally have box lengths of between 12 and 30 feet (as opposed to tractor trailers that have 5 axles and trailer lengths of 45 to 53 feet).

**Structural pallet rack**    racking system that uses bolts or other mechanical fasteners (as opposed to Boltless Pallet rack). Structural Pallet Rack is sometimes used to support the roof of the structure (Rack-supported buildings), eliminating the need for posts.

**Super bill of material**    type of planning bill of material that is created at a very high level tying together a larger and more complex family of products than a typical planning bill. see Planning bill of material

**Tandems**            Refers to the rear tandem axles (the back 8 wheels on an 18 wheeler) on a trailer that can be adjusted forward or backward on the trailer to even out load weights or make for more stable loading (tandems all the way back).

**Task interleaving**            term used in describing functionality of Warehouse Management Systems to mix tasks to reduce travel time. Sending a forklift driver to put away a pallet on his way to his next pick is an example of task interleaving.

**Terminal emulation**        software used on desktop and portable computers that allows the computer to act like a terminal connected to a mainframe system. If you have a networked desktop PC and are accessing mainframe programs ( a.k.a. green screen programs) you are using terminal emulation. Terminal emulation is also a common method used to connect portable computers (as in warehouse bar code data collection systems) to mainframe software. Also see Screen Mapping

**Third-party logistics**        (abbreviated 3PL) describes businesses that provide one or many of a variety of logistics-related services. Types of services would include public warehousing, contract warehousing, transportation management, distribution management, freight consolidation. A 3PL provider may take over all receiving, storage, value added, shipping, and transportation responsibilities for a client and conduct them in the 3PL's warehouse using the 3PL's equipment and employees, or may manage one or all of these functions in the client's facility using the client's equipment, or any combination of the above. Another term, 4PL is sometimes used to describe businesses that manage a variety of logistics related services for

clients by using 3PLs. Also see Public Warehouse and Contract Warehouse or visit International Warehouse Logistics Association (IWLA) site.

**Tilt-tray sorter** conveyor sorting system that uses a series of tilting devices (carriers) to sort materials. Each tilting carrier has a tray and is mounted on a conveyor, as the carrier passes the drop-off point, it will tilt allowing the materials to fall onto another conveyor, down a chute, or into some type of container. . a.k.a. Tilt-tray conveyor

**Time buckets** term sometimes used to describe forecast periods.

**Time fence** period of time prior to the scheduled production date beyond which changes can be made without significant adverse effects.

**TMS** Transportation management system (see separate listing).

**Towline Conveyor** material handling system that uses a towline (usually a chain) recessed beneath the floor to pull wheeled carts along a fixed path. Towline conveyors have been used for more than 50 years in manufacturing facilities.

**Trailer** a.k.a. Semi Trailer, Tractor Trailer. Generally describes enclosed trailers used to transport materials between locations. Standard lengths for trailers are 45', 48', and 53, with standard internal width of 98" to 99" and internal height of 105" to 110". Refrigerated trailers, also known as "reefers," have smaller internal widths of between 90" and 96" and heights of 96" to 100". Other types of trailers include flatbeds, low boys, and container chassis. Also see Container

**Trailer creep** Trailer creep (also known as trailer walk, dock walk) occurs when the lateral and vertical forces exerted each time a lift truck enters and exits the trailer cause the trailer to slowly move away from the dock resulting in separation from the dock leveler. Factors that affect trailer creep are the weight and speed of the lift truck and load, the grade of the drive the trailer is parked on, the softness of the suspension, the type of transition (dock levelers, dock boards) being used, and whether the trailer has been dropped off (spotted) or if it is still connected to the tractor.

**Transportation management system** Category of operations software that may include products for shipment manifesting, rate shopping, routing, fleet management, yard management, carrier management, freight cost management. Also see Shipping Manifest System.

**Transverse flue space** Term used by fire codes to describe the space to either side of pallet in racked storage. Flue spaces allow the water from an overhead sprinkler system to reach lower levels of the rack. Normally a transverse flue space of at least 3 inches is required. Also see Longitudinal Flue Space.

**Turret truck** turret trucks are a man-up lift truck similar to an order selector with the exception that rather than fixed forks the forks are mounted on an additional mast and carriage that operates as a turret, turning 90 degrees in either direction facilitating picking and stocking on either side of the aisle. The man-up design makes it easier to handle loads in very tall racking. Very-narrow-aisle trucks are generally recommended to be used in conjunction with a guidance system (wire, rails, optical) within the aisles to increase safety and reduce property damage. Also Turret Trucks require that the floor be perfectly flat and level to operate correctly. Also see Lift Truck Pics , Lift Truck Basics, and The Aisle Width Decision for more info.

**Unit load** material handling term that describes any configuration of materials that allow it to be moved by material handling equipment as a single unit. While smaller manually handled configurations could be considered unit loads, the term generally defines larger configurations that would be moved by a lift truck such as palletized loads, crates, bales, etc. a.k.a. unitized load

**Unit of measure** (abbreviated U/M) describes how the quantity of an item is tracked in your inventory system. The most common unit of measure is "eaches" (EA), which simply means that each individual item is considered one unit. An item that uses "cases" (CA or CS) as the unit of measure would be tracked by the number of cases rather than by the actual piece quantity. Other examples of units of measure would include pallets (PL), pounds (LB), ounces (OZ), linear feet (LF), square feet (SF), cubic feet (CF), gallons , thousands, hundreds, pairs, dozens. Also see Unit-of-measure Conversion.

**Unit-of-measure conversions** a unit-of-measure conversion is needed whenever you work with multiple units of measure. For example, if you purchased an item in cases (meaning that your purchase order stated a number of cases rather than a number of pieces) and then stocked the item in eaches, you would require a conversion to allow your system to calculate how many eaches are represented by a quantity of cases. This way, when you received the cases, your system would automatically convert the case quantity into an each quantity.

**Vehicle restraint systems** devices that prevent trailers from moving away from the loading dock. One of the most popular is the ICC bar type restraint system. These systems incorporated a device that engages the ICC bar (rear impact guard) on the rear of the trailer preventing it from moving away from the dock. These devices may be mechanically or hydraulically operated and may vary in design and functionality from one manufacturer to another. There are also other types of restraints such as those that automatically engage the rear wheels of the trailer. As with the ICC bar restraints, the wheel engagement restraints also vary significantly from one manufacturer to another. There is not a one-system-fits-all solution for vehicle restraints, ICC bar systems may not work with damaged ICC bars, lift gates, and low-boy trailers. Wheel engagement systems are more expensive and may have problems in northern climates due to snow or ice. See article on Dock Safety and Dock Equipment Pics for more info.

**Vendor-managed inventory (VMI)** phrase used to describe the process of a supplier managing the inventory levels and purchases of the materials he supplies. This process can be very low tech, such as an office supplies supplier or maintenance supplies supplier coming into your facility once per week to visually check stock levels and place a re-supply order, or high tech, such as an electronic component supplier having remote access to your inventory management and MRP system and producing and automatically shipping to meet your production schedule. Vendor-managed inventory reduces internal costs associated with planning and procuring materials and enables the vendor to better manage his inventory through higher visibility to the supply chain. Vendor-managed inventory may be owned by the vendor (consignment inventory) or the customer.

**Very narrow aisle** Lift trucks that operate in aisles less than six feet and often use guidance systems (wire, rail, or optical) to travel within the aisles. Types of VNA trucks include order selectors, swing mast, pivot, mast, and turret trucks. See also article [The Aisle Width Decision](#)

**VNA** Very narrow aisle (see separate listing)

**Voice directed** see [Speech-based technology](#)

**Walkie or Walkie-rider** see [Motorized Pallet Truck](#)

**Warehouse Control System** software used to control automated systems such as sortation systems, AS/RS, AGV's, and carousels in the warehouse. A WCS may also have functionality similar to a WMS just as some WMS's have WCS functionality.

**Warehouse management system** computer software designed specifically for managing the movement and storage of materials throughout the warehouse. WMS functionality is generally broken down into the following three operations: Putaway, Replenishment, and Picking. The key to these systems is the logic to direct these operations to specific locations based on user defined criteria. WMSs are often set up to integrate with data-collection systems. Read my article on [Warehouse Management Systems](#).

**Wave picking** Variation on zone picking where rather than orders moving from one zone to the next for picking, all zones are picked at the same time and the items are later sorted and consolidated into individual orders/shipments. Wave picking is the quickest method for picking multi item orders however the sorting and consolidation process can be tricky. Picking waves are often designed to isolate shipments to specific carriers, routes, etc. See also [batch picking](#), [zone picking](#) A more general definition of wave picking would simply be a method where a group of orders is released to the warehouse for picking and the next group (wave) is not released until the first wave has processed through the pick area.

**WCS** Warehouse control system (see separate listing)

**Weighted out** Describes a condition where the weight capacity of a trailer or container has been met. The term "weighted out" is most likely used when you have met the weight capacity

of the trailer or container but still have physical space left in the trailer or container. Also see Cubed out.

**WIP** Work in Process—generally describes inventory that is currently being processed in an operation, or inventory that has been processed through one operation and are awaiting another operation. WIP is actually an inventory account that represents the value of materials, labor, and overhead that has been issued to manufacturing but has not yet produced a stockable item. Depending on how your accounting and inventory systems are set up, it may also include components picked for production usage or finished products awaiting final inspection.

**Wire-guided** term used to describe vehicles that use a wire embedded in the floor to guide the vehicles. Wire guidance systems are frequently used with order selectors and turret trucks in very narrow aisle applications. They are also used with automated guided vehicles.

**WMS** Warehouse management system (see separate listing)

**Work-in-process** WIP - generally describes inventory that is currently being processed in an operation, or inventory that has been processed through one operation and are awaiting another operation. WIP is actually an inventory account that represents the value of materials, labor, and overhead that has been issued to manufacturing but has not yet produced a stockable item. Depending on how your accounting and inventory systems are set up, it may also include components picked for production usage or finished products awaiting final inspection.

**Zone picking** order picking method where a warehouse is divided into several pick zones, order pickers are assigned to a specific zone and only pick the items in that zone, orders are moved from one zone to the next (usually on conveyor systems) as they are picked (also known as "pick-and-pass"). See also batch picking, wave picking See article on Order Picking.